

BLACKBIRD MANAGEMENT IN NORTH DAKOTA:
PAST, PRESENT, AND FUTURE

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Commercial sunflower production began in the United States in 1966 (Flaskerud, 1994). Sunflower production peaked during 1979 with 5.5 million acres of which 3.5 million were in North Dakota (Flaskerud, 1994). North Dakota continues to be the number one producer of sunflowers in the United States.

During the production of any crop, a producer must contend with a variety of problems, including weather, weeds, and disease to insects and birds. In 1991, Lamey et al. (1993) surveyed 2,655 (i.e., 20%) of the sunflower producers in North Dakota on pest problems and pesticide use. Producers (n=416) ranked insects as number 1 and blackbirds as the number 2 production problem.

From 1979 through 1981, Hothem et al. (1988) surveyed the peak production areas of North Dakota, South Dakota, and Minnesota for bird damage. Bird damage was estimated between \$5 million and \$8 million per year, with 2.2% of the producers having more than 10% damage. In North Dakota during the years 1986 through 1991, sunflower bird damage was estimated to be more than \$10 million or \$1.67 million annually (Huffman, 1992).

Peak sunflower production area overlaps geographically with the peak migration and breeding areas for blackbirds (Icteridae) within the prairie pothole region of North Dakota. Red-winged blackbirds (Agelaius phoeniceus), common grackles (Quiscalus quiscula), and yellow-headed blackbirds (Xanthocephalus xanthocephalus) are the primary species responsible for sunflower damage in North Dakota (Linz et al., 1984; Twedt et al., 1991; Homan et al., 1994). During 1990, North Dakota contained 1,143,000 breeding pairs of red-winged blackbirds, 786,000 breeding pairs of common grackles, and 391,000 pairs of yellow-headed blackbirds (Nelms et al., 1994). The number of breeding pairs of blackbirds will likely increase as wetland habitat improves with above average rainfall during the last three years. Also, the addition of the conservation reserve program (CRP) has expanded the available habitat for breeding red-winged blackbirds. Johnson and Igl (1995) estimated that CRP lands averaged 175,000 breeding pairs of red-winged blackbirds during 1992 and 1993, and that the population of breeding pairs in North Dakota had risen to 1,535,600 breeding pairs in 1993.

Producers can change their cultural practices to help reduce

their losses to blackbirds. Sunflower fields should not be planted adjacent to wetlands or shelterbelts and should be kept weed and insect free (Hanzel, 1985; Otis and Kilburn, 1988). Due to the rotation schedule of sunflowers, it is not always feasible to avoid planting near trees or wetlands during the growing season. Producers can also plant varieties that include bird-resistant traits; long, leafy involucral bracts, horizontally oriented heads or heads that face downward, long head to stem distance, and concave shaped heads (Hanzel and Gulya, 1993).

When the problem becomes severe, many producers call upon the U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Animal Damage Control (ADC). ADC is mandated by Federal law to protect agriculture, property, natural resources, and human health and safety. ADC manages wildlife damage by utilizing an integrated pest management approach.

Since the 1960s, ADC has been involved with blackbird damage management. Prior to 1986, ADC was part of the U.S. Fish and Wildlife Service before being moved to the U.S. Department of Agriculture. The primary sequence for ADC to get a blackbird damage management tool to the producer starts with research. The majority of blackbird damage research has been done by the Denver Wildlife Research Center (DWRC) and North Dakota State University.

ADC encourages producers to try to alleviate the damage by using nonlethal technics before using lethal methods. Pyrotechnics are traditional nonlethal techniques that continue to be used to scare birds from the field. During the 3-year period of 1992-1994, ADC distributed more than 95,000 rounds of bangers and screamers (Fig. 1). The pyrotechnic program ended in 1995 when the funding was switched to cattail control.

The U.S. Congress approved money for the hazing of blackbirds during the 1986 fiscal year (Handegard, 1988). The hazing program used a pilot and a gunner in a Piper Super Cub. The crew flew over problem sunflower fields in the attempt to move depredating blackbirds out of the field. The hazing program ran for 10 years between 1986-1995 Federal fiscal year in North Dakota. During this 10-year period, the ADC program accumulated 21,456 hours and answered over 6,000 complaints (Fig. 2 and Fig. 3). Hazing was a short-term answer to a long term problem. Therefore, on the advice of the National Sunflower Association, funding for hazing was reallocated to the cattail control program.

Managing large cattail-choked marshes could reduce the large amounts of damage to individual producers and distribute the damage over a larger area resulting in a lower percentage of damage to each producer. During 1981, the U.S. Fish and Wildlife Service ADC had their second meeting with Dow Chemical Company to determine the effectiveness of using Dalapon to control cattails (Van Meter, 1981). The U.S. Fish and Wildlife Service determined

that the control of cattails was promising, but that it was a low priority during 1981.

In 1989, Dr. George Linz of the DWRC, decided to bring chemical control of cattails to the forefront. Four marshes were initially sprayed with glyphosate (Rodeo^R mixture, Monsanto Company, St. Louis MO) to eliminate the cattails in the wetlands (Linz and Bergman, 1989). Three of the four original marshes still do not harbor noticeable numbers of depredating blackbirds. ADC operations began using cattail control as a management technique in 1991 (Fig. 4). In 1995, ADC eliminated the hazing and pyrotechnic programs and placed the congressional funding into cattail control. Cattail control has been shown to reduce damage to sunflowers and reduce the breeding population of blackbirds over multiple years (Linz et al., 1995b,c). Cattail control has also been welcomed by environmental groups because it can increase populations of waterfowl (Linz et al., 1996) and of species of special concern such as the black tern (Linz et al., 1994a).

Lethal techniques such as shotguns have been around almost as long as the combination of blackbirds and sunflowers. But shotguns are limited to only removing a few blackbirds at a time. Consequently, DWRC began work on repellents and toxicants in the 1960s and 1970s.

Avitrol (4-aminopyridine) was first described by Goodhue and Baumgartner (1965). In 1972, Avitrol was nationally registered for use as a bird repellent by the Environmental Protection Agency (EPA). Avitrol causes the bird that ingests the treated bait (e.g., corn chops) to act erratically, squawk, and cause tremors and convulsions before death. In effect, it causes the sick bird to scare away other depredating birds from the area. After years of research by DWRC, Avitrol was applied by ADC in 1986 and 1990 (Huffman, 1992b). Huffman (1992b) also reported that Avitrol produced inconsistent results and therefore its use was discontinued. Avitrol is registered by the EPA and the state of North Dakota and is currently being used on a limited basis by some producers.

The avian toxicant, DRC-1339 (3-chloro-4-methylbenzenamine HCL), was developed during the 1960's by the Denver Wildlife Research Center for population reduction of European starlings (Sturnus vulgaris) (West, 1968). In 1989, ADC operations began using DRC-1339 treated brown rice baits under a Special Local Need [Section 24(c)] on the blackbird wintering grounds of Evangeline Parish, Louisiana (Cummings et al., 1992). After evaluating the program, Glahn et al. (1990) suggested that DRC-1339 significantly reduced depredating blackbird populations in the rice growing area of Louisiana.

In 1989, ADC operations in North Dakota tested DRC-1339 on treated sunflower meats (Clay, 1989). The baits were distributed on the ground in sunflower rows that had been knocked down by an

all-terrain vehicle. In 1991, the use of DRC-1339 was shifted to that portion of the field that actually had sunflower damage occurring (Huffman, 1992a). Huffman (1992a) suggested that DRC-1339 may be a useful tool to protect sunflower fields from depredating blackbirds. DWRC began testing the efficacy of fall baiting using DRC-1339. Linz et al. (1995d) determined that blackbirds have a preference for brown rice over sunflower meats and cracked corn. In 1993, a field study was initiated by DWRC to evaluate the use of DRC-1339 in sunflower fields using rice baits. After 2 years of evaluation, it was apparent that DRC-1339 failed to protect ripening sunflowers (Linz and Bergman, 1996).

Research on migration patterns of male red-winged blackbirds moving through spring roosts in South Dakota has shown that these birds are likely to breed in the sunflower growing areas of North Dakota and South Dakota (Knittle et al., 1987; Linz et al., 1993). Therefore, during the spring of 1993, DWRC began assessing the feasibility of using DRC-1339 to reduce the population of migrating blackbirds in South Dakota (Linz et al., 1995). DWRC has completed 2 years of research during the spring of 1994 and 1995, using DRC-1339-treated brown rice baits on spring staging areas under the auspices of Study Protocol QA-369 (Linz et al., 1994b). Preliminary data has shown that treating spring staging areas with DRC-1339 has potential for reducing populations of red-winged blackbirds. Research by DWRC will continue to evaluate efficacy of using DRC-1339 and the potential nontarget hazards, especially ring-necked pheasants (Phasianus colchicus).

As technology advances so does our ability to come up with additional tools for blackbird control. In 1970, DWRC began a 4-stage program to determine the probability of using chemosterilants to reduce populations of red-winged blackbirds (Guarino and Schafer, 1973). Guarino and Schafer (1973) stated the chemosterilants showed promise as a technique for population control of red-winged blackbirds. In a way, chemosterilants have again made their way to the forefront. DWRC is currently working on immunocontraceptives for population control of red-winged blackbirds. DWRC's research is in its infancy, but it holds promise for the future.

Due to blackbird damage to sunflowers, producers continue to try a variety of techniques to alleviate the cause of their aggravation. Even though they are not registered, producers have tried such unlikely candidates as garlic water (Pates, 1995) and hot sauce applied to the sunflower fields. ADC will continue to use the limited tools available (i.e., cattail control and DRC-1339) and look for new tools (e.g., immunocontraceptives) in the ever raging battle of sunflower producers versus blackbirds.

Literature Cited

Clay, W. H. 1989. DRC-1339 staging area baiting plots. Typed

report. U.S. Dep. Agric., North Dakota Animal Damage Control, Bismarck.

Cummings, J. L., J. F. Glahn, E. A. Wilson, J. E. Davis, Jr., D. L. Bergman, and G. A. Harper. 1992. Efficacy and nontarget hazard of DRC-1339 treated rice baits used to reduce roosting populations of depredating blackbirds in Louisiana. U.S. Dep. Agric., Denver Wildl. Res. Cent., Denver, CO. Bird Sec. Res. Rep. 481. 40pp.

Flaskerud, G. 1994. Production. Pages 6-8 in D. R. Berglund, ed. Sunflower Production. North Dakota State Univ. Ext. Serv., Fargo. Ext. Bull. 25.

Glahn, J. F., E. A. Wilson, and M. L. Avery. 1990. Evaluation of DRC-1339 baiting program to reduce sprouting rice damage caused by spring roosting blackbirds. U.S. Dep. Agric., Denver Wildl. Res. Cent., Denver, CO. Bird Sec. Res. Rep. 448. 25pp.

Goodhue, L. D., and F. M. Baumgartner. 1965. Applications of new bird control chemicals. J. Wildl. Manage. 36:1317-1320.

Guarino, J. L., and E. W. Schafer, Jr. 1973. A program for developing male chemosterilants for red-winged blackbirds. Proc. Bird Control Seminar 6:201-205.

Handegard, L. L. 1988. Using aircraft for controlling blackbird/sunflower depredations. Proc. Vertebr. Pest Conf. 13:293-294.

Hanzel, J. J. 1985. Sunflower pest management: birds. Pages 49-51 in M. P. McMullen, ed. Sunflower production and pest management. North Dakota State Univ. Ext. Serv., Fargo. Ext. Bull. 25 (revised).

_____, and T. J. Gulya. 1993. Registration of two bird-resistant oilseed sunflower germplasm lines. Crop Sci. 33:1419-1420.

Homan, J. H., G. M. Linz, and W. J. Bleier. 1994. Effect of crop phenology and habitat on the diet of common grackles (Quiscalus quiscula). Am. Midl. Nat. 131:381-385.

Hothem, R. L., R. W. DeHaven, and S. D. Fairaizl. 1988. Bird damage to sunflower in North Dakota, South Dakota, and Minnesota, 1979-1981. U.S. Fish Wildl. Serv., Washington, D.C. Fish Wildl. Tech. Rep. 15. 11pp.

Huffman, L. E. 1992a. 1991 use of DRC-1339 in North Dakota. Typed report. U.S. Dep. Agric., North Dakota Animal Damage Control, Bismarck.

_____. 1992b. Magnitude and potential solutions of blackbird-

sunflower problem. Pages 7-8 in G. M. Linz, ed.
Proceedings of the cattail management symposium. U.S. Dep.
Agric. and U.S. Fish Wildl. Serv., Fargo, ND.

Johnson, D. H., and L. D. Igl. 1995. Contributions of the
conservation reserve program to populations of breeding
birds in North Dakota. *Wilson Bull.* 107:709-718.

Knittle, C. E., G. M. Linz, B. E. Johns, J. L. Cummings, J. E.
Davis, Jr., and M. M. Jaeger. 1987. Dispersal of male red-
winged blackbirds from two spring roosts in central North
America. *J. Field Ornithol.* 58:490-498.

Lamey, H. A., M. P. McMullen, D. R. Berglund, J. L. Luecke, D. K.
McBride, and R. K. Zollinger. 1993. 1991 Sunflower grower
survey of pest problems and pesticide use in Kansas,
Minnesota, and North Dakota. North Dakota State Univ. Ext.
Serv., Fargo. Ext. Rep. 12. 15pp.

Linz, G. M., and D. L. Bergman. 1989. Wetland habitat
management: a new approach for reducing blackbird damage to
sunflower. Pages 63-75 in Proceedings of the sunflower
reseachers workshop. Bismarck, ND.

_____, and _____. 1996. DRC-1339 avicide fails to protect
ripening sunflower. *Crop Prot.* In Press.

_____, _____, and W. J. Bleier. 1995a. Birds associated with
blackbird spring feeding sites in South Dakota. *Prairie
Nat.* 27:11-15.

_____, _____, D. C. Blixt, and W. J. Bleier. 1994a. Response of
black terns (*Chlidonias niger*) to glyphosate-induced habitat
alterations on wetlands. *Colonial Waterbirds* 17:160-167.

_____, _____, H. J. Homan, and W. J. Bleier. 1995b. Effects of
herbicide-induced habitat alterations on blackbird damage to
sunflower. *Crop Prot.* 14:In press.

_____, D. C. Blixt, D. L. Bergman, and W. J. Bleier. 1995c.
Responses of red-winged blackbirds, yellow-headed blackbirds
and marsh wrens to glyphosate-induced alterations in cattail
density. *J. Field Ornithol.* 67:167-178.

_____, _____, D. L. Bergman, and W. J. Bleier. 1996. Responses
of glyphosate-induced habitat alterations in wetlands.
Wetlands In Press.

_____, L. A. Mendoza, D. L. Bergman, and W. J. Bleier. 1995d.
Preferences of three blackbird species for sunflower meats,
cracked corn and brown rice. *Crop Prot.* 14:375-378.

_____, L. J. Linz, J. M. Thompson, and W. J. Bleier. 1993.
Using geographic variation to predict breeding locales of

- migrating red-winged blackbirds. *Prairie Nat.* 25:127-133.
- _____, D. L. Vakoch, J. F. Cassel, and R. B. Carlson. 1984.
Food of red-winged blackbirds (Agelaius phoeniceus) in
sunflower fields and corn fields. *Can. Field Nat.* 98:38-44.
- _____, W. J. Bleier, D. L. Bergman, M. J. Kenyon, and A. E.
Barras. 1994b. Evaluation of the efficacy and nontarget
hazards of DRC-1339-treated rice baits for reducing spring
migratory blackbird populations in South Dakota. U.S. Dep.
Agric., Denver Wildl. Res. Cent., Denver, CO. Study
Protocol QA-369. 22pp.
- Nelms, C. O., W. J. Bleier, D. L. Otis, and G. M. Linz. 1994.
Population estimates of breeding blackbirds in North Dakota,
1967, 1981-1982 and 1990. *Am. Midl. Nat.* 132:256-263.
- Otis, D. L., and C. M. Kilburn. 1988. Influence of
environmental factors on blackbird damage to sunflower.
U.S. Fish and Wildl. Serv., Washington, D.C. Fish Wildl.
Tech. Rep. 16. 11pp.
- Pates, M. 12 September 1995. Garlic water stinks as pest
deterrent. *Fargo Forum*. pB1.
- Twedt, D. J., W. J. Bleier, and G. M. Linz. 1991. Geographic
and temporal variation in the diet of yellow-headed
blackbirds. *Condor* 93:975-986.
- Van Meter, H. 18 June 1981. Notes on the Dalapon meeting
(Dowpon C).
- West, R. R. 1968. Reduction of a winter starling population by
baiting its pre-roosting area. *J. Wildl. Manage.* 21:637-
649.

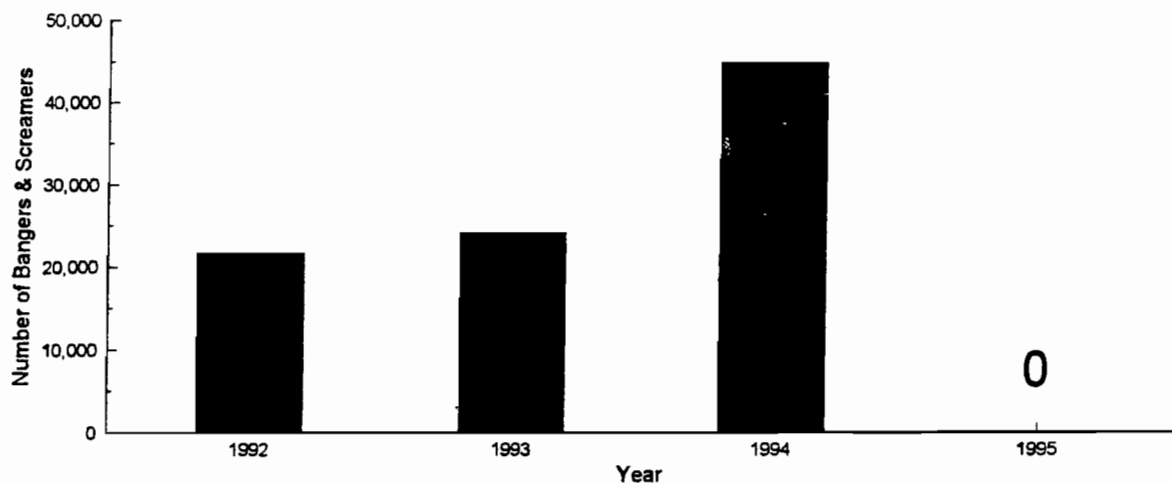


Fig. 1. Pyrotechnics distributed to sunflower producers within North Dakota during 1992-1995.

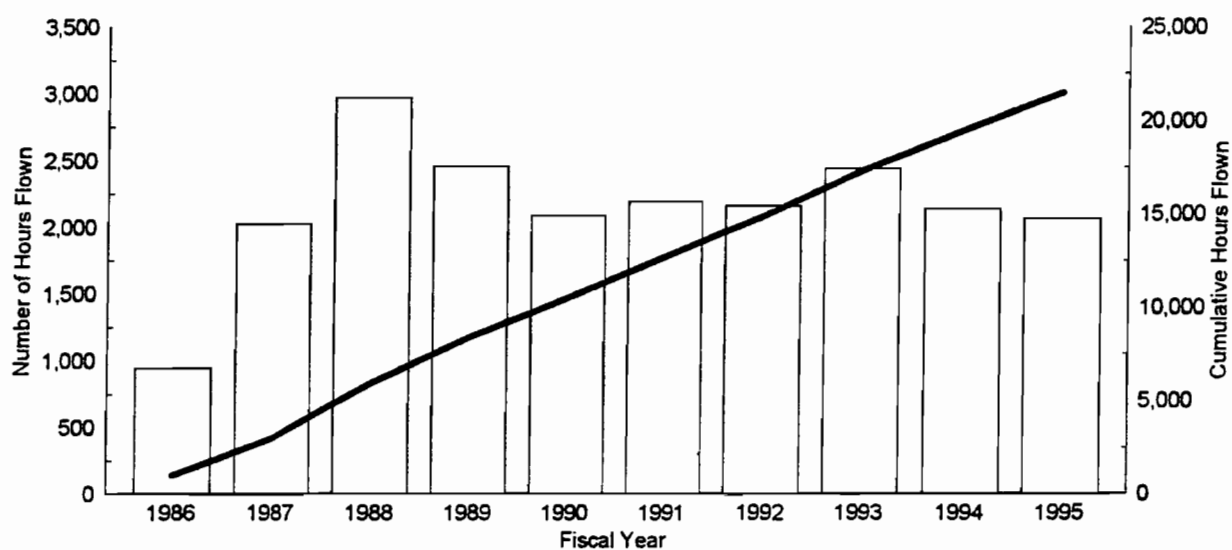


Fig. 2. Number of hazing hours flown in Piper Super Cubs during the years 1986 to 1995 in North Dakota.

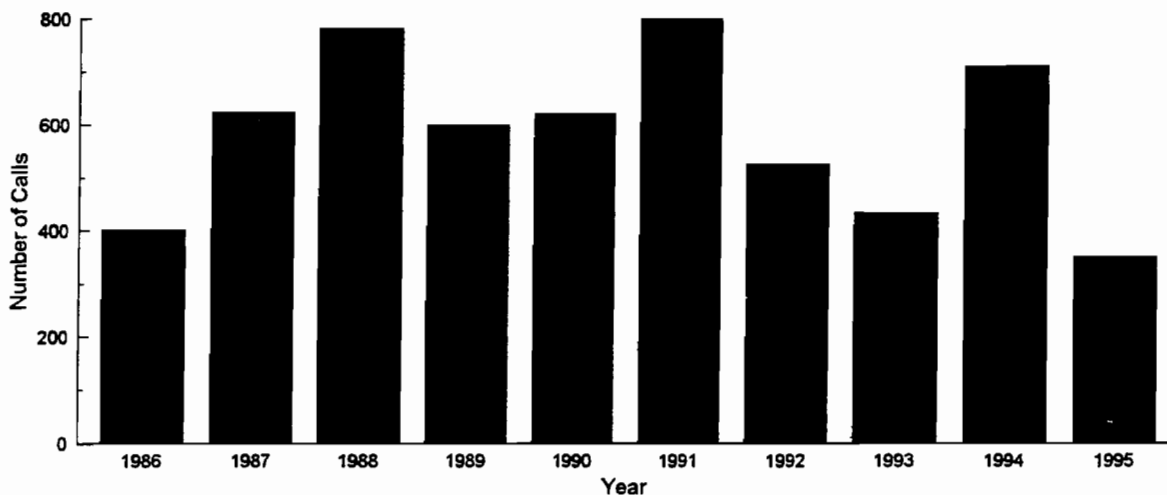


Fig. 3. Number of calls received in North Dakota in reference to blackbird damage.

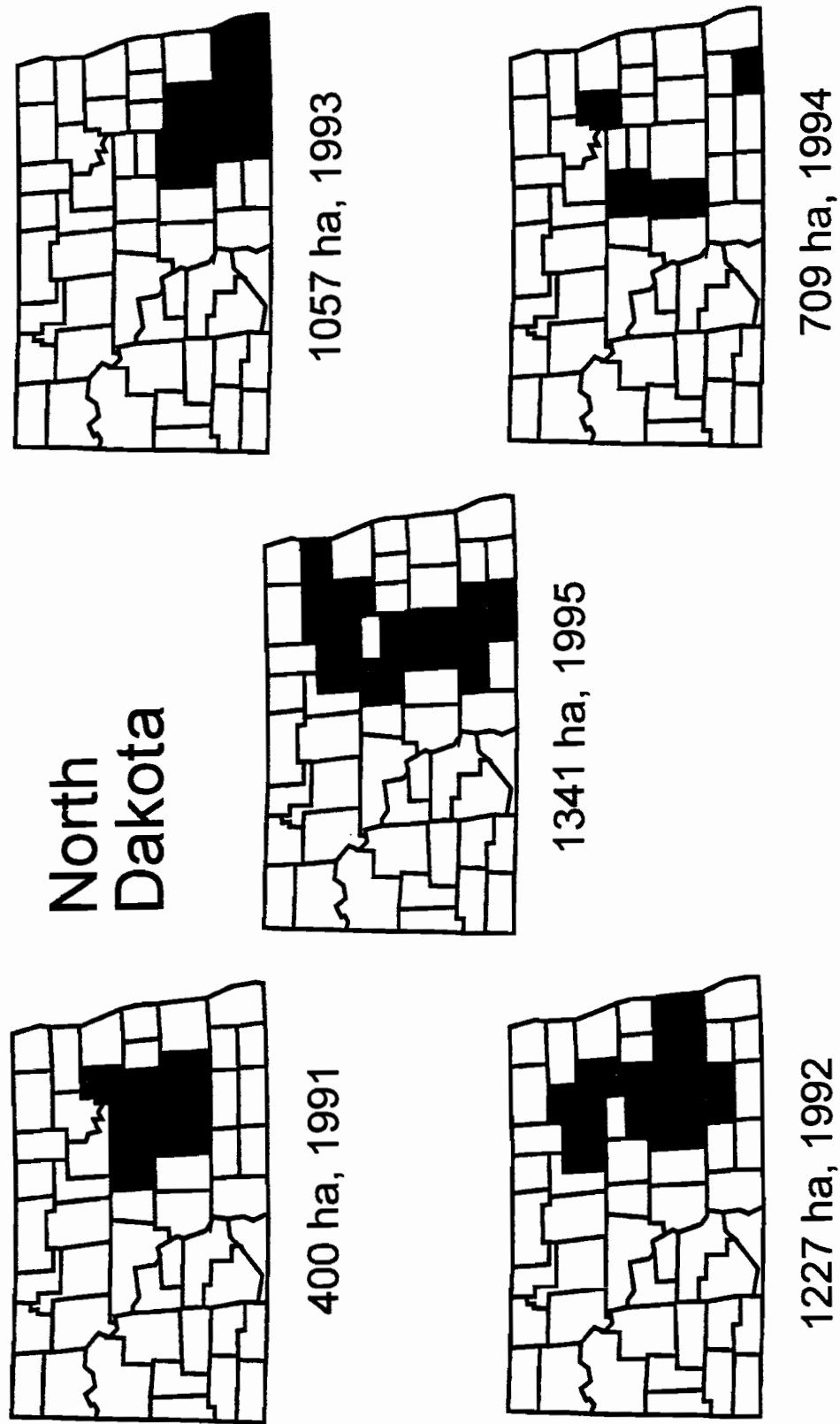


Fig. 4. Hectares of cattails sprayed with glyphosate and the counties within North Dakota that they were sprayed in during 1991 to 1995.